→ USPTO CENTRAL

## 10/590,588

# 1-5. (CANCELED)

6. (CURRENTLY AMENDED) A method of operating a drive motor driving both a tractor and a trailer via a traveling power takeoff shaft, the [[a]] traveling power takeoff shaft having at least three discrete, shiftable power takeoff stages and the traveling power takeoff shaft being that is connected, via a clutch, to [[a]] the drive motor, wherein one of a wheel speed and a vehicle speed is known determined and the traveling power takeoff shaft is electronically matched, via a motor speed of rotation, is electronically matched in ratio with to a ratio of at least one of the determined vehicle speed and the determined wheel speed, the method comprising the steps of:

shifting a power takeoff stage to one of a corresponding next higher and the next lower discrete shiftable power takeoff stage, upon attainment of one of a higher and a lower threshold value of the drive motor speed of rotation, the higher threshold value corresponding to a next higher power takeoff stage and the lower threshold value corresponding to a next lower power takeoff stage, to one of the corresponding next higher and the next lower power takeoff stage so as to maintain an optimal drive for both the tractor and the trailer so that both the tractor and the trailer travel together substantially as an integrated unit.

- 7. (CURRENTLY AMENDED) The method according to claim 6, further comprising the step of compensating for a difference, when starting must be from a zero speed, between a speed of rotation at said zero speed and [[a]] the lower threshold speed of rotation of the motor, by utilizing a strong greater clutch-slippage of the traveling power take-off shaft.
- 8. (CURRENTLY AMENDED) The method according to claim 6, further comprising the step of achieving, in a case of self-driven trailers, with a knowledge of slip, by means of an evaluation by an electronic system, an optimal speed of rotation ratio between [[a]] the tractor and [[a]] the trailer.

### 10/590,588

- 9. (PREVIOUSLY PRESENTED) The method according to claim 6, further comprising the step of adjusting the ratio of the vehicle speed to the traveling power take-off shaft speed of rotation to a current demand by manual intervention during travel.
- 10. (CURRENTLY AMENDED) A method of operating a traveling power takeoff shaft connected by a clutch to a drive motor <u>for driving both a tractor and a trailer</u>, the method comprising the steps of:

providing at least three discrete, shiftable power takeoff stages; sensing a wheel rotational speed with a sensor;

defining a lower motor rotational speed threshold value to correspond to a next lower power takeoff stage of the least three discrete, shiftable power takeoff stages;

comparing the wheel rotational speed to the lower motor rotational speed threshold value;

electronically matching rotation of a traveling power takeoff shaft to the wheel rotational speed, by adjusting a rotational speed of the drive motor;

shifting to the next lower power takeoff stage when the rotational speed of the drive motor achieves the lower motor rotational speed threshold value; and

maintaining an optimal drive for both the tractor and the trailer, by shifting to a desired one of the least three discrete shiftable power takeoff stages, so that both

the tractor and the trailer travel together with one another substantially as an integrated

unit.

11. (PREVIOUSLY PRESENTED) The method according to claim 10 further comprising the step of compensating for a difference in the drive motor rotation speed between a zero rotation speed and the lower motor rotation speed threshold value when, starting from the zero rotation speed, by allowing clutch slippage of the traveling power take off shaft.

10/410 JO1 PM

#### 10/590,588

- 12. (CURRENTLY AMENDED) The method according to claim 10 further comprising the step of utilizing clutch slip and an electronic system to optimize a speed of rotation ratio between [[a]] the tractor and [[a]] the trailer, in a case of self-driven trailers.
- 13. (PREVIOUSLY PRESENTED) The method according to claim 10, further comprising the step of adjusting a ratio of the vehicle speed to the rotation of the traveling power take-off shaft to current demand by manual intervention during travel.
- 14. (CURRENTLY AMENDED) A method of operating a traveling power takeoff shaft that is connected to a drive motor by a clutch and [[a]] the traveling power takeoff shaft having at least three discrete, shiftable power takeoff shaft gear stages, the method comprising the steps of:

monitoring <u>at least one of</u> a vehicle travel speed <u>and a rear wheel</u>

<u>rotational speed</u> with a sensor; and

adapting a rotational speed of the power takeoff shaft to conform to one of the [[the]] vehicle travel speed and the rear wheel rotational speed, so that a towed trailer travels at the same speed as the vehicle, by one of:

electronically shifting the traveling power takeoff shaft to a next higher takeoff shaft gear stage of the least three discrete, shiftable power takeoff stages, if a rotational speed of the drive motor essentially equals an upper rotational speed threshold; and

electronically shifting the traveling power takeoff shaft to a next lower takeoff shaft gear stage of the least three discrete, shiftable power takeoff stages, if the rotational speed of the drive motor essentially equals a lower rotational speed threshold; and

adapting <u>slip</u> engagement <del>(slip)</del> of the clutch of the power takeoff shaft to match a difference between the rotational speed of the power takeoff shaft at a

104410-3:01 PM

10/W10 -3:91 PM

# 10/590,588

vehicle travel speed of zero and the lower rotational speed threshold of the drive motor to a predefined ratio.

- 15. (NEW) The method according to claim 6, wherein the at least three discrete shiftable power takeoff stages comprise a low stage, an intermediate stage and a high stage.
- 16. (NEW) The method according to claim 15, wherein the low stage is approximately 540 RPM, the intermediate stage is approximately 750 RPM and the high stage is approximately 1000 RPM.
- 17. (NEW) The method according to claim 10, wherein the at least three discrete shiftable power takeoff stages comprise a low stage, an intermediate stage and a high stage.
- 18. (NEW) The method according to claim 17, wherein the low stage is approximately 540 RPM, the intermediate stage is approximately 750 RPM and the high stage is approximately 1000 RPM.
- 19. (NEW) The method according to claim 14, wherein the at least three discrete shiftable power takeoff stages comprise a low stage, an intermediate stage and a high stage.
- 20. (NEW) The method according to claim 19, wherein the low stage is approximately 540 RPM, the intermediate stage is approximately 750 RPM and the high stage is approximately 1000 RPM.